

REMARKS

Reconsideration and allowance of the present application based on the following amendments and remarks are respectfully requested.

Claim 16 is cancelled without prejudice or disclaimer. Claims 1, 3-4, 6-7, 9, 12 and 15 are amended. Claims 17-29 are added. After entry of this amendment, claims 1-15 and 17-29 will remain pending in the application.

Claims 3-4, 6-7 and 9 are amended to correct minor clerical mistakes.

Claims 11 and 13 were rejected under 35 U.S.C. §112, first paragraph. Applicants respectfully traverse the rejection and submit that claims 11 and 13 fully comply with the enablement requirement.

The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation. See MPEP 2164.01 In addition, in order to make a rejection, the Examiner has the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention. See MPEP 2164.04 (emphasis added). Namely, the language of the rejection should focus on those factors, reasons and evidence that lead the Examiner to conclude that the specification fails to teach how to make and use the claimed invention without undue experimentation, or that the scope of any enablement provided to one skilled in the art is not commensurate with the scope of protection sought by the claims. See MPEP 2124.04

In light of what it is stated in the Office Action, however, Applicants respectfully submit that the Examiner has not provided the reasons that led him to conclude that the specification failed to teach how to make and use the claimed invention without undue experimentation.

The Examiner only contends, with respect to claim 11, that “the alignment radiation and the projection beam having the same wavelength” is not sufficiently described in the written description. Applicants point out that claim 11 as filed is part of the specification and that the originally filed claim 11 clearly shows that the inventors were in possession of the invention at the time of filing. See MPEP 2163 citing *In Re Koller*, 613 F.2d 819, 204 USPQ 702 (CCPA 1980). In addition, it is respectfully submitted that one skilled in the art could make or use the invention from the disclosure with information known in the art without undue experimentation.

With respect to claim 13, the Examiner only contends that “swapping the first and the second side of the substrate” is not sufficiently described in the written description. Applicants respectfully disagree with this statement and direct the Examiner’s attention to at least paragraphs [0051], [0052], [0053] and [0054] to find sufficient disclosure in the written description.

Accordingly, reconsideration and withdrawal of the rejection of claims 11 and 13 under 35 U.S.C. §112, first paragraph are respectfully requested.

Claims 1-3, 6, 7, 11, 12, 14 and 15 were rejected under 35 U.S.C. §102(b) based on Moriyama et al. (U.S. Pat. No. 4,798,470) (Moriyama). The rejection is respectfully traversed.

Applicants note that claim 16 has, rightfully, not been rejected over Moriyama and therefore respectfully submit that claim 16 is allowable. Applicants note, in this respect, that Moriyama fails to teach or suggest a substrate wherein the first side further includes an alignment mark for use with the alignment system of the lithographic projection system. Claim 15 has been amended to positively recite the feature of claim 16. Therefore, it is respectfully submitted that claim 15, as amended, is allowable.

Claim 1 is patentable over Moriyama, at least because it recites a lithographic projection apparatus comprising, *inter alia*, an optical system to transmit an image of the alignment mark from a side of the substrate opposite the target portion for use by the alignment system, wherein the optical system is arranged to provide an image of said alignment mark in a plane which is substantially perpendicular to an optical axis of the alignment system, the image being located outside of a perimeter of the substrate. Moriyama does not teach or suggest an apparatus including at least this feature. Therefore, Moriyama does not describe each and every feature recited by claim 1 and, as a result, cannot anticipate this claim.

In contrast to the apparatus recited by claim 1, Moriyama discloses a pattern printing apparatus which comprises detecting means for detecting a target mark provided on the surface of a wafer which is opposite to the surface thereof on which a pattern is to be printed. (See Abstract). In Moriyama, however, the formed image is not located outside of a perimeter of the substrate.

The Office Action contends that Moriyama discloses an optical system arranged to transmit an image of the alignment mark at a plane of the first side of the substrate. In response, Applicants respectfully submit that it is the projected image 126 of the target reticle

mark 115 that is formed on the same plane of the through-hole 121 as the surface of the wafer and not the image of an alignment mark provided on the substrate (as recited in claim 1) (see col. 5, lines 39-41). In addition, Applicants respectfully submit that projection of the image of target mark 115 is performed with projecting lens 104 and not with an optical system from a side of the substrate opposite the target portion. Therefore, it is respectfully submitted that Moriyama cannot anticipate claim 1.

Claims 2-3, 6, 7, 11 are patentable by virtue of their dependency from claim 1 and for the additional features recited therein.

Claim 12, as amended, is patentable over Moriyama at least because it recites a device manufacturing method comprising, *inter alia*, transmitting an image of said alignment mark from a side of the substrate opposite the target portion, for use in the aligning, wherein said image of said alignment mark is in a plane which is substantially perpendicular to an optical axis of the alignment system and is located outside of a perimeter of the substrate. Moriyama does not teach or suggest a method including at least this feature. Therefore, Moriyama does not describe each and every feature recited by claim 12 and, as a result, cannot anticipate this claim.

Claim 14 depends from claim 12 and is allowable for the same reasons given above related to claim 12 and for the additional feature recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-3, 6, 7, 11, 12, 14 and 15 under 35 U.S.C. §102(b) over Moriyama are respectfully requested.

Claims 1, 3, 9 and 11, 12 and 14 were rejected under 35 U.S.C. §102(b) based on Yoichi (JP 1164032). Applicants respectfully submit that the amendment to claims 1 and 12 obviates the rejection.

Claim 1, as amended, is patentable over Yoichi, at least because it recites a lithographic projection apparatus comprising, *inter alia*, an alignment system, located on a same side of the substrate as the projection system, to align a pattern of the patterning structure with an alignment mark provided on the substrate, using alignment radiation and an optical system to transmit an image of the alignment mark from a side of the substrate opposite the target portion for use by the alignment system, wherein the optical system is arranged to provide an image of said alignment mark in a plane which is substantially perpendicular to an optical axis of the alignment system, the image being located outside of a perimeter of the substrate. Yoichi does not teach or suggest an apparatus including at least

these features. Therefore, Yoichi does not describe each and every feature recited by claim 1 and, as a result, cannot anticipate this claim.

In contrast to the apparatus recited by claim 1, Yoichi discloses an apparatus including an alignment system located on the rear side of the substrate that detects an alignment mark, located on the surface of the substrate, using light that penetrates the substrate and a sensitive material. (See Abstract). In Yoichi, the position of the alignment mark image produced on the receiving surface of a two-dimensional optoelectronic conversion element is captured photo-electronically using the alignment detector 8, which is located underneath the substrate. Therefore, in Yoichi, the detector is not located on the same side of the projection system and the image of the mark is not located outside of the perimeter of the substrate. As a result, it is respectfully submitted that Yoichi cannot anticipate claim 1.

Claims 3, 9 and 11 depend from claim 1 and are allowable for the same reason given above related to claim 1 and for the additional features recited therein.

Claim 12, as amended, is patentable over Yoichi at least because it recites a device manufacturing method comprising, *inter alia*, transmitting an image of said alignment mark from a side of the substrate opposite the target, for use in the aligning, and aligning with an alignment system said image of said alignment mark with the pattern of the patterning structure used in the projecting of the patterned beam of radiation with a projection system, wherein said image of said alignment mark is in a plane which is substantially perpendicular to an optical axis of the alignment system and is located outside of the perimeter of the substrate, and wherein the alignment system and the projection system are located on a same side of the substrate. Yoichi does not teach or suggest a method including at least this feature. Therefore, Yoichi does not describe each and every feature recited by claim 12 and, as a result, cannot anticipate this claim.

As mentioned previously, Yoichi fails to teach or suggest an apparatus wherein the alignment system is located on the same side of the substrate as the projection system and wherein the image of the mark is located outside of the perimeter of the substrate. Therefore, it is respectfully submitted that Yoichi cannot anticipate claim 12.

Claim 14 depends from claim 12 and is allowable for the same reason given above related to claim 12 and for the additional feature recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 3, 9 and 11-12, and 14 under 35 U.S.C. §102(b) based on Yoichi are respectfully requested.

Claims 1, 3, 5-8 and 11-16 were rejected under 35 U.S.C. §102(e) based on Heinle (U.S. Pat. No. 6,525,805). The rejection is respectfully traversed.

Applicants point out that the filing date of Heinle is May 14, 2001. By contrast, claims 1, 3, 5-8 and 11-16 claim priority to the European application EP01300302, which was filed on January 15, 2001. Applicants note that European application EP01300302 is in English; so no translation is necessary. The receipt of a certified copy of the priority document, dated January 15, 2001, was acknowledged by the Office in Confirmation filing receipt No. 4688 sent on May 6, 2002.

Accordingly, Applicants respectfully request that the rejection of claims 1, 3, 5-8 and 11-16 under 35 U.S.C. 102(e) over Heinle be withdrawn.

Claims 1, 3-5, 7, 9-12, 14 and 15 were rejected under 35 U.S.C. §102(e) over Sogard et al. (Sogard) (U.S. Pat. No. 6,376,329). Applicants respectfully submit that the amendment to claims 1, 12 and 15 obviates the rejection.

Applicants note that claim 16 has, rightfully, not been rejected over Sogard and therefore respectfully submit that claim 16 is allowable. Applicants note, in this respect, that Sogard fails to teach or suggest a substrate wherein the first side further includes an alignment mark for use with the alignment system of the lithographic projection system. Claim 15 has been amended to positively recite the feature of claim 16. Therefore, it is respectfully submitted that claim 15, as amended, is allowable.

Claim 1, as amended, is patentable over Sogard, at least because it recites a lithographic projection apparatus comprising, *inter alia*, an alignment system, located on a same side of the substrate as the projection system, to align a pattern of the patterning structure with an alignment mark provided on the substrate, using alignment radiation. Sogard does not teach or suggest an apparatus including at least this feature. Therefore, Sogard does not describe each and every feature recited by claim 1 and, as a result, cannot anticipate this claim.

In contrast to the apparatus recited by claim 1, Sogard discloses an alignment system using backside illumination. In Sogard, the alignment system is not located on the same side of the substrate as the projection system. (See FIGS. 1, 2A, 4, 5A). Therefore, it is respectfully submitted that Sogard cannot anticipate claim 1.

Claims 3-5, 7, 9-11 depend from claim 1 and are allowable for the same reason given above related to claim 1 and for the additional features recited therein.

Claim 12 as amended, is patentable over Sogard because it recites a device manufacturing method comprising, *inter alia*, transmitting an image of said alignment mark from a side of the substrate opposite the target, for use in the aligning, and aligning with an alignment system said image of said alignment mark with the pattern of the patterning structure used in the projecting of the patterned beam of radiation with a projection system, wherein said image of said alignment mark is in a plane which is substantially perpendicular to an optical axis of the alignment system and is located outside of the perimeter of the substrate, and wherein the alignment system and the projection system are located on a same side of the substrate. As mentioned previously, Sogard does not teach or suggest an apparatus including at least this feature. Therefore, Sogard does not describe each and every feature recited by claim 12 and, as a result, cannot anticipate this claim.

Claim 14 depends from claim 12 and is allowable for the same reason given above related to claim 12 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1, 3-5, 7, 9-12, 14 and 15 under 35 U.S.C. §102(e) over Sogard are respectfully requested.

New claims 17-29 are directed to additional features of the original disclosure. Support for these new claims may be found, for example, in FIGS. 2, 5-10. Applicants respectfully submit that new claims 17-27 are in condition for allowance.

Applicants have addressed all the Examiner's rejections and respectfully submit that the application is in condition for allowance. A notice to the effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Respectfully submitted,
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